AMENDMENTS TO THE CLAIMS

1. (Original) Purification process of carbon nanotubes characterized in that it comprises at least the following steps.

- solubilization of the carbon nanotubes (p-NT) through their organic functionalization in which the functionalization reaction is obtained on the nanotubes with 1,3-dipolar reaction of azomethine ylides and separation from metal contaminants,

- purification from carbon contaminants of functionalized carbon nanotubes (f-NT) obtained in the previous step by precipitation of functionalized carbon nanotubes with solvents from their organic solutions,

- heat treatment of functionalized carbon nanotubes obtained in the previous step to regenerate the initial non-functionalized carbon nanotubes free from traces of metal and carbon contaminants.

2. (Original) Purification process of carbon nanotubes as claimed in claim 1 wherein the carbon nanotubes are functionalized through a 1,3-dipolar reaction with:

a) compounds with a general formula 1

R'-NH-CHR"-COOR"' 1

where R', R" and R"' equal to or different from one another may be H or alkyl groups with the formula C_nH_{2n+1} with n between 1 and 20, or an aromatic group, or limited to R', R"' an ether group with the formula $(CH_2CH_2O)_n$ with n between 1 and 20 and

b) compounds with a general formula 2

R""-CHO 2

where R"" may be H or an alkyl group with the formula C_nH_{2n+1} with n between 1 and 20, or an ether group with the formula $(CH_2CH_2O)_n$ with n between 1 and 20, or an aromatic group.

3. (Original) Purification process of carbon nanotubes as claimed in claim 2 wherein the 1,3-dipolar reaction is conducted in dipolar aprotic solvent chosen from the group constituted by dimethylformamide (DMF), dimethylsulphoxide, sulpholane, orthodichlorobenzene with reagents in excess and temperature over 100°C for at least 24 hours.

4. (Original) Purification process of carbon nanotubes as claimed in claim 1 wherein the separation from metal contaminants is obtained with mechanical means chosen from filtration and centrifugation of the organic solution deriving from the functionalization reaction of raw carbon nanotubes.

5. (Original) Purification process of carbon nanotubes as claimed in claim 1 wherein purification from carbon contaminants is obtained starting out with an organic solution containing functionalized carbon nanotubes in polar or apolar solvents, chosen from the group constituted by methylene chloride and chloroform, by precipitation with one or more treatments with polar or apolar solvents, chosen from the group constituted by diethylether, petroleum ether, alkanes, alcohols and separation with mechanical means chosen from centrifugation and filtration.

6. (Original) Purification process of carbon nanotubes as claimed in claim 1 wherein the initial carbon nanotubes are obtained by dry heating the functionalized carbon nanotubes in an atmosphere with air or inert gases at temperatures ranging from 250° to 350°C for times between 1 minute and one hour.

7. (Original) Purification process of carbon nanotubes as claimed in claim 1 wherein the initial carbon nanotubes are obtained by dry heating the functionalized carbon nanotubes at temperatures ranging from 250° to 350°C for times between 1 minute and one hour under vacuum.

8. (Currently Amended) Purification process of carbon nanotubes as claimed in claim ~~6 and 7~~ 1 wherein the initial carbon nanotubes defunctionalized by heat treatment are separated with mechanical means chosen from centrifugation and filtration of their suspensions obtained by sonication in polar or apolar organic solvents chosen from the group constituted by dichloromethane, chloroform, toluene.

9. (Currently Amended) Functionalized carbon nanotubes ~~obtained~~ obtainable with 1,3-dipolar reaction with the carbon nanotubes and:

a) compounds with a general formula 1

R'-NH-CHR"-COOR"' 1

where R', R" and R"' equal to or different from one another may be H or alkyl groups with the formula C_nH_{2n+1} with n between 1 and 20, or an aromatic group, or limited to R', R"' an ether group with the formula $(CH_2CH_2O)_n$ with n between 1 and 20 and

b) compounds with a general formula 2

R''''-CHO 2

where R'''' may be H or an alkyl group with the formula C_nH_{2n+1} with n between 1 and 20, or an ether group with the formula $(CH_2CH_2O)_n$ with n between 1 and 20, or an aromatic group

except for compounds in which: R', R'', R''' and R'''' are equal to one another and equal to H; R' is equal to an ether group with the formula $-(CH_2CH_2O)_3-CH_3$ and R'', R''' and R'''' are equal to one another and equal to H; R' is equal to an alkyl group with the formula $-CH_2(CH_2)_6CH_3$ and R'', R''' and R'''' are equal to one another and equal to H; R' is equal to an ether group with the formula $-(CH_2CH_2O)_3-CH_3$, R'', R''' are equal to each other and equal to H and R'''' is equal to –phenyl-OCH_3; R' is equal to an ether group with the formula $-(CH_2CH_2O)_3-CH_3$, R'', R''' are equal to each other and equal to H and R'''' is equal to a pyrene group.

10. (Currently Amended) Functionalized carbon nanotubes ~~obtained~~ obtainable with 1,3-dipolar reaction as claimed 9 in which said reaction is conducted in a dipolar aprotic solvent chosen from the group constituted by dimethylformamide (DMF), dimethylsulphoxide, sulpholane, orthodichlorobenzene with reagents in excess and temperature over 100°C for at least 24 hours.